

**HEALTH AND SAFETY COMMISSION AND EXECUTIVE
AGRICULTURE INDUSTRY ADVISORY COMMITTEE**

Overhead Power Lines

Summary

1. This paper provides a brief update on incidents involving overhead power lines (OHPL) and the status of the reviews of relevant guidance applicable to farming, forestry and arboriculture.

Background

2. During discussion on the report of the AIAC Transport Project Group 2005-2008 at the last AIAC meeting on 18 March 2008 (paper AIAC 080302), members asked for an update on incidents and activity relating to OHPLs. This topic was specifically discussed at the Transport Project Group workshop sponsored by the Energy Network Association (ENA) in December 2006.

3. The 'workshop' provided an opportunity for stakeholder organisations to share and discuss information and identify guidance currently available to help farmers and others avoid contact with overhead power lines. The available guidance is still under review (for various reasons as explained below) and research has been commissioned relevant to this issue - by HSE, the Forestry Commission and electrical distribution companies.

Energy Network Association (ENA)

4. ENA is funded by and represents the UK gas and electricity transmission and distribution companies. ENA's "Safety, Health and Environment Committee" (SHE) had identified agriculture as a priority sector to target for accident reduction and wished to open up dialogue with the agricultural community to develop appropriate and effective guidance, as part of ENA's Health and Safety Advisory Committee's 'SAFELEC 2010' initiative. The AIAC Transport Group provided a ready-made 'Agriculture Engagement Group' for them to consult relevant key organisations in the industry.

5. The terms of reference of ENA's Public Safety Committee (PSC), which reports to their Safety, Health and Environment (SHE) Committee and gives it strategic direction, are:

- To review the application of the Electricity Safety Quality and Continuity Regulations (ESQCR) and to share 'good practice';
- To identify and share publicity initiatives and to identify where national publicity might usefully be employed;
- To review and update, as appropriate, existing ENA publicity materials;
- To review and consider public safety educational material.

6. ENA's Public Safety Committee want to build on the success of their campaign to reduce accidents involving anglers' fishing rods contacting OHPLs, and intend to use this campaign as a model for influencing other industries. They needed to engage with HSE, landowners, employers and employees organisations as well as equipment manufacturers.

7. A powerpoint presentation describing ENA's role and the structure and objectives of its committees is available on the AIAC Transport Group page on HSE's website <http://www.hse.gov.uk/aboutus/hsc/iacs/aiac/131206/ena.pdf> . This presentation also summarises relevant accidents and ENA guidance.

Accident History

8. HSE receives reports of relatively few (work-related) fatalities, major injuries and dangerous occurrences relating to OHPL contacts on farms, etc. Over the 10 years 1997/98 to 2006/07, 14 fatalities related directly to agricultural operations.

However, more comprehensive statistics are available from the HSE/BERR's internet-based 'Electricity Incidents Database', compiled from incidents reported by the electricity companies. Under ESQCR they are required to report all contacts with the electrical infrastructure, including by persons not employed (directly or indirectly) by the electrical industry. Each report is validated by HSE's Electrical Networks Inspectors.

9. ENA presented a series of graphs based on this database at the workshop held in December 2006 to illustrate the significant accident history involving the electrical network over farm land. These are included in the presentation referred to above and available via the web link in para 7.

10. These indicated that in the 10 years to 31 March 2005, 128 non-electrical industry workers were killed as a result of contact with OHPLs. (NB. These figures include non-agricultural activities/operations.) 16% of these fatal accidents involved tipper trailers, lorry-mounted cranes and grabs ('Hiabs') and other cranes, of which 55% occurred at farms - mostly on roads and in fields. Ladders and poles were involved in 13% of the fatal OHPL contacts, and of these, 27% were reported to have occurred at farms (mostly in fields) and 16% on the highway. The remainder occurred at unknown locations.

11. Utility arboriculture is also a significant contributor, with tree climbing and tree cutting being involved in 4% of the fatal incidents. Fishing and boat mast contacts each accounted for 2% of the total fatalities.

12. In addition to the fatalities ~300 injury incidents are reported across all industries each yr (a total of 3,357 over the 10 years to 31/3/05). Nearly half of these

were caused by contact with underground equipment but 17% involved OHPLs (12% being caused by contact with conductors and 5% with OHPL supports). A further 4000-5,000 'near misses' are reported every year under the ESQCR reporting regime.

13. A detailed analysis of the latest available information from the 'Electrical Incidents Database' is being prepared. It is hoped that this will be available for the AIAC meeting on 8 July.

Guidance

14. ENA have produced several relevant 'public safety' leaflets, including "Safety Information for Farmers and Agricultural Contractors" (March 2006 v1) and 'Engineering Recommendation' G55/1: "Safer Tree Working in Proximity to Overhead Electric Lines". ENA are currently reviewing G55/1, but wish to find new ways to influence farming and associated industries, including forestry and arboriculture.

15. HSE has also published guidance on working near OHPLs specifically for agriculture, eg in 'Farmwise' and various other leaflets - in particular Agriculture Information Sheet AIS 8(rev) "Working Safely Near OHPLs" and INDG389 "Shock Horror" (both revised in 2006). This hazard was also covered in various HSE videos.

16. Advice specifically for forestry and arboriculture is currently given in two AFAG leaflets: AFAG 404 "Electrical Utility Arboriculture" (last re-printed in August 2006), AFAG 804 "Electricity at Work: Forestry and Arboriculture" (July 2004). These are currently under revision. It is proposed that AFAG 404 will be superseded by ENA's revised G55) and AFAG 804 will be revised to reflect the changes to G55.

17. In addition, a number of HSE's other general publications are relevant, in particular the priced Guidance Note GS6 "Avoidance of Danger from Overhead Electric Power Lines". This is also currently being revised, in consultation with the construction industry and relevant Sectors within HSE. The revised draft is to be circulated to members of the AIAC Transport Group for comment when it is available.

18. OHPLs and other electrical hazards are also covered in HSE's CD-based and downloadable 'Farm Self Assessment' software. This was devised to help farmers carry out risk assessments and direct them to relevant guidance. Copies of the CD are given to farmers attending HSE's Agricultural 'Safety Health and Awareness Days' (SHADs), together with 'Farmwise' and other relevant leaflets.

19. HSE's Agriculture & Food Sector, subject to a review of existing publications, proposed to include the risk of contact with OHPL's in a planned Agricultural Information Sheet (AIS) aimed at those erecting plastic structures. It has just been discovered that ENA have also produced a guidance note specifically on this, so they will need to be consistent.

20. Stakeholders at the joint ENA/AIAC Transport Group Workshop agreed that machinery dealers and other suppliers should be made aware of relevant leaflets and suggested that copies could be provided for distribution to their clients. It was also

agreed that this should be publicised through HSE's Agriculture e-Bulletin and 'Treework News'.

21. It was reported that distribution companies have also spent a considerable amount of money publicising electrical hazards, eg Scottish and Southern Energy have produced articles and featured this topic at farming events such as the Royal Highland Show and Western Power Distribution produced a DVD aimed at the construction industry, which it was suggested could be circulated to farmers. Other companies have also produced guidance material aimed at specific industries as well as for the public in general, and have offered to work with HSE, eg EDF Energy have exhibited at farming and arboriculture SHADs and at shows in the eastern region.

22. The Sector has discussed these 'local' initiatives with ENA and their "Public Safety Committee" and it is proposed to coordinate companies efforts to maximise impact. It was also agreed that a new approach is needed, working together with the industry stakeholders to share knowledge and experience of what works, and to identify and use our respective networks to influence those working in the industries and in control of operations.

23. Effective communication is vital to get the message across to all involved in the industry. This is likely to involve a wide range of media and trade journals and stakeholders technical guidance and newsletters. Case studies are needed to help emphasise the 'business benefits'. The Transport Group have previously explored this through the NFU Mutual and the AIC (Agricultural Industries Confederation - whose members include feed producers and distributors). It was also felt that 'shock messages' are more effective at grabbing attention and persuading farmers to adopt good practice. The next steps will be informed by the recent "Insight" report and current discussions following the review by Judith Donovan.

24. Members at the workshop agreed that the proposed campaign on OHPLs should not just be about producing more guidance or publicity but using a range of methods, e.g. providing warning decals (warning stickers) on machines and inclusion of the topic in HSE's SHADs. This hazard is mentioned in relevant scenarios and the NAAC have produced a decal and provide documentation for their members as part of their model risk assessment. However, design and placement of decals as standard on machines is subject to European Standards.

25. It was recognised that better liaison was needed between occupiers, contractors and hauliers. Other stakeholder Groups should also be used as a conduit to engage with these different interests, eg The East Anglia based 'Food Industry Safety and Health Network' (FISHNet) has run a seminar/workshop for its members on electrical safety. This used a risk assessment approach, highlighting practical precautions during deliveries and collection of loads. The IoSH Rural Industries Group was also suggested as a suitable and effective forum, through their seminars/networking events.

Design of Machinery/Standards issues

26. The risk of contact with OHPLs is increasing as machinery is getting larger, reducing the clearance distance under OHPLs – not just within fields but at entrances from roads. Aerials are commonly being fitted to the cabs of combine harvesters and

other high machines, increasing the risk of contact or flashover. For example, in one incident in 2007, a combine came into contact with a line measured at 5.56m, well over the statutory minimum of 5.2m.

27. Transport Group members reported that 11kV cables crossing fields cause the industry greatest concern and they consider that OHPLs should ideally follow hedge lines, or at least be at the correct height across fields. In accordance with ESQCR, electricity companies must ensure that no overhead line is operated **below** the statutory minimums quoted in the regulations. Land-owners should report non-compliance to the appropriate electricity company for immediate rectification. However, the 'safe clearance' distance quoted is a matter of continuing debate and differing advice is given. This is influenced by line voltage and weather conditions and it is hoped this will be 'standardised' through the current reviews of guidance to ensure they are consistent.

28. Design of machinery is subject to European and International Standards. There has been a long-running 'debate' in the European Standards committee on crop sprayers over the design of sprayer booms and limits on height of folding, to avoid contact with OHPLs. The AEA tried to set up a study at Harper Adams Agricultural College to determine the extent of the problem and to find solutions. Many machines used in agriculture and forestry are not designed or built in the UK and other EU Member States do not appear to have the same problem as UK farmers, working in proximity and low clearance under OHPLs. As mentioned above, the potential to introduce warning decals in tractors is restricted as these are also controlled by European standards.

29. OHPL 'proximity' or 'presence sensors' have been developed and are commercially available to alert drivers to OHPLs, eg during spraying or other farming operations. However, these have not been universally accepted and HSE has misgivings about their use, due to their potential unreliability, they provide insufficient stopping time and spurious or too-regular warnings when a machine passes near to an OHPL. This is likely to lead to operators potentially ignoring significant warnings, or turning them off. Devices also have to be reset to work accurately in differing environments, eg to detect different line voltages or to accommodate varying magnetic field, atmospheric or ground conditions.

30. However, the potential effectiveness of such devices is increasing and it may be possible to attach suitable devices specifically to those particular parts of machines which might come into contact with OHPLs, eg sprayer booms or materials handler buckets, etc. Also, as all fields are now mapped electronically (for Government funding/grant purposes) and with the increasing sophistication and use of GPS/SatNav systems to accurately control vehicle operations within precise parameters and distances, it might soon be feasible to install automatic warnings of the location of existing hazards and even link these to machine control systems, eg to prevent booms folding in the vicinity of OHPL's. However, detailed research and evaluation would be needed for these to be considered reliable and acceptable.

Current Research

31. The integrity of a range of safety devices (including an OHPL proximity

sensor) are currently being evaluated by the Health and Safety Laboratory, for HSE.

32. The Electricity Safety Quality and Continuity (Amendment) Regulations 2006 (which came into force in October 2006) has significantly increased the amount of work felling and reducing the size of trees in proximity to OHPLs, in order for power distribution companies to meet their obligations to maintain supply. Scottish and Southern are working closely with HSE and the Forestry Commission on this and have commissioned ADAS to assess alternative systems of work. It is intended that this will form the basis of industry/AFAG guidance, to be further developed as part of the AFAG OHPL Project proposed as part of the AFAG Workplan for 2008-09. ENA, the Forestry Commission, contractors and other key stakeholders will be represented on this AFAG 'task and finish' project group.

33. Research jointly-funded by HSE and the Forestry Commission as part of AFAG's current project on mechanically-assisted takedown and felling of edge trees was recently completed and the report is awaited. This has the potential to establish safer work methods and identify techniques that may be useful in situations where trees in proximity to power lines have to be felled. It will also identify additional training needs for those responsible for planning, managing and supervising work as well as for operators.

Action/Recommendation

32. AIAC members are invited to:

- a) note the available guidance and overall progress made to revise and update these;
- b) note ongoing research and proposals for new areas of work;
- c) acknowledge the contribution of the many individuals, industry bodies and other stakeholder organisations who have supported the AIAC Transport Group and HSE,
- d) discuss and offer any comment how to communicate relevant messages more effectively within the industry, and
- e) provide examples and information to produce case studies for publicity.

Contact

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